Radiotoxicity and Risk Reduction of TRU Elements from Spent Fuel by Transmutation in the Light Water Reactor

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A conventional PWR of type VVER-440 operating in a sustainable advanced fuel cycle mode with complete recycling of TRU elements in an Inert Matrix Combined Fuel Assembly (IMC-FA) in the same reactor was investigated. A preliminary assessment and the differences between various nuclear fuel cycles in terms of the risk analysis and its indicators has been conducted. The results indicate that the sustainable advanced fuel cycle option can, for the same amount of energy generation, significantly reduce both the amounts and radiotoxicity of the spent nuclear fuel in comparison with the conventional once-through UO_2 or MOX fuel cycles.

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